AMENDMENTS TO THE CLAIMS

Claims 1-4 (Cancelled)

5. (Previously presented) The apparatus of Claim 44, wherein the feedback loop adjusts at least one of an amplification of the transmitter and the gain of the photodiode to maintain a desired RMS level of the electrical signal.

Claims 6-7 (Cancelled)

8. (Previously presented) The apparatus of Claim 44, wherein the receiver further includes an integrate-and-dump circuit that integrates an energy value of the noise over a bit interval.

9. (Previously presented) The apparatus of Claim 8, wherein the receiver further includes a subtractor component that receives a state indicator signal and subtracts a high-state +A or a low-state -A state from the electrical signal based on the state indicator signal.

10. (Previously presented) The apparatus of Claim 9, wherein the receiver further includes a squaring function that squares an output from the subtractor component and transmits the squared output to the integrate-and-dump circuit.

11. (Cancelled)

12. (Previously presented) The apparatus of Claim 44, wherein the feedback loop includes a state means calculation component configured to compute at least one of a high state means and a low state means of the electrical signal.

13. (Currently amended) The apparatus of Claim 45, wherein the feedback loop includes:

a high energy calculation component configured to compute an average energy for a high-state A;

a low energy calculation component configured to compute an average energy for a low-state -A; and

a comparator configured to compare a ratio of the average energies for the high-and low-states A, -A with a predetermined threshold, the threshold indicating that the temperature-induced breakdown of the photodiode is imminent.

14. (Currently amended) The apparatus of Claim 45, wherein the ratio is a ratio of an average energy of a high-state A of the electrical signal and an average energy of a low-state A of the electrical signal is greater than a predetermined threshold, the threshold indicating that the temperature-induced breakdown of the photodiode is imminent.

15. (Cancelled)

16. (Currently amended) An optical system, comprising:

a transmitter configured to transmit an optical signal;

a receiver including an avalanche photodiode configured to receive the optical signal and to output an electrical signal; and

a feedback loop for increasing dynamic range of the receiver when an optical signal is high and preventing temperature-induced breakdown of the avalanche photodiode, the ~~component~~feedback loop

monitoring a noise level of at least a portion of the electrical signal including determining a presence or absence of the optical signal at the receiver, computing at least one of a high state means and a low state means of the electrical signal, computing an average noise energy for the high-

state A, computing an average noise energy for the low-state –A, and computing a ratio of the average noise energies for the high- and low-states A, -A, and

preventing temperature-induced breakdown, including using the ratio as an indicator of temperature-induced breakdown, and reducing at least one of an optical amplification of the transmitter and a gain of the receiver when the ratio is greater than a predetermined threshold, the threshold indicating that breakdown of the photodiode is imminent.

17. (Original) The optical system of Claim 16, wherein the transmitter includes an optical amplifier.

18. (Cancelled)

19. (Currently amended) The optical system of Claim 16, wherein the feedback loop ~~monitoring component~~ adjusts at least one of an amplification of the transmitter and gain of the receiver to maintain a desired RMS level of the electrical signal.

20-23 (Canceled)

24. (Previously presented) An aircraft comprising:

a fuselage;

a propulsion system operatively coupled to the fuselage; and

an optical system configured to transmit signals, the optical system including:

a transmitter configured to transmit an optical signal, the transmitter including an optical amplifier;

a receiver configured to receive the optical signal and to output an electrical signal; and

a monitoring component to provide a feedback loop to increase a dynamic range of the receiver when an optical signal is high without measuring a temperature of the surrounding environment of the receiver, the monitoring component to:

monitor a noise level of at least a portion of the electrical signal, and

reduce at least one of an amplification of the transmitter and a gain of the receiver when a ratio of an average energy of a high-state A of the electrical signal and an average energy of a low-state A of the electrical signal is greater than a predetermined threshold, the threshold value being at a point where a breakdown voltage of the receiver is eminent.

25. (Cancelled)

26. (Previously presented) The aircraft of Claim 24, wherein the receiver includes an avalanche photodiode.

27. (Previously presented) The aircraft of Claim 24, wherein the monitoring component is configured to monitor an output voltage of the electrical signal and to adjust at least one of an amplification of the transmitter and a gain of the receiver to maintain a desired RMS level of the electrical signal.

28. (Previously presented) The aircraft of Claim 24, wherein the monitoring component includes a noise energy calculation component configured to calculate a noise level of at least a portion of the electrical signal.

29. (Previously presented) The aircraft of Claim 24, wherein the monitoring component includes:

a high energy calculation component configured to compute an average noise energy for the high-state A;

a low energy calculation component configured to compute an average noise energy for the low-state -A; and

a comparator configured to compare a ratio of the average noise energies for the high- and low-states A, -A with a predetermined threshold.

30. (Cancelled)

31. (Previously presented) The aircraft of Claim 24, wherein the monitoring component includes:

a condition determining component configured to determine at least one of a presence or an absence of light at the receiver;

a state means calculation component configured to compute at least one of a high state means and a low state means of the electrical signal;

a high energy calculation component configured to compute an average noise energy for the high-state A;

a low energy calculation component configured to compute an average noise energy for the low-state -A; and

a comparator configured to compare a ratio of the average noise energies for the high- and low-states A, -A with a predetermined threshold.

32. (Currently amended) The method of claim 46, wherein computing the ratio of noise energy includes: ~~A method of controlling an output of an optical system, the method comprising:~~

~~receiving an optical signal with a receiver in an environment exhibiting significant variation in temperature;~~

~~using a photodiode of the receiver to convert the optical signal to a corresponding electrical signal; and~~

~~using a feedback loop to increase dynamic range of the receiver when an optical signal is high and preventing breakdown of the photodiode by adjusting gain of the receiver when the optical signal is high, including:~~

~~computing noise in the electrical signal, and adjusting gain of the photodiode as a function of the computed noise without measuring temperature of the~~

~~environment; and computing a ratio of high- and low-states to prevent breakdown of the photodiode and possible interruption of the receiver, including:~~

computing an average energy for a high-state A of the electrical signal;

computing an average energy for the low-state -A of the electrical signal; and

computing ~~comparing~~ a ratio of the average energies for the high- and low-states A, -A. ~~with a threshold value, the threshold value indicating that breakdown of the photodiode is imminent.~~

33-36. (Cancelled)

37. (Previously presented) The method of Claim 32, wherein an avalanche photodiode is used to convert the optical signal, and wherein the ratio is compared to a breakdown threshold of the avalanche photodiode.

38. (Cancelled)

39. (Previously presented) The method of Claim 32, wherein computing the noise in the electrical signal includes integrating a noise energy value over a bit interval.

40. (Previously presented) The apparatus of Claim 44, wherein computing noise in the electrical signal includes receiving a state indicator signal that indicates a condition of the optical signal, and subtracting a high-state +A or a low-state -A state from the electrical signal based on the state indicator signal.

41. (Cancelled)

42. (Currently amended) The method of Claim 32, wherein the gain ~~at least one of an amplification of the optical signal and a gain of the receiver~~ is reduced when the [[a]] ratio of the average energy of the high-state A and the average energy of the low-state A is greater than [[the]] a predetermined threshold.

43. (Previously presented) The method of Claim 32, further comprising determining at least one of a presence or an absence of light at the receiver prior to computing the average energies.

44. (Currently amended) An apparatus operable in an environment exhibiting significant variation in temperature, the apparatus comprising:

an optical signal transmitter; and

an optical signal receiver for receiving an optical signal from the transmitter, the receiver including a photodiode for converting the optical signal to an electrical signal;

the receiver further including a feedback loop for monitoring the electrical signal outputted by the photodiode, computing a ratio of noise energy for high and low signal in the monitored signal, <u>using the ratio to determine when temperature-induced breakdown is imminent,</u> and adjusting gain of the photodiode as a function of the ratio <u>to prevent breakdown</u>;

wherein the feedback loop adjusts the gain without using measured temperature of the environment.

45. (Previously presented) The apparatus of claim 44, wherein the photodiode is an avalanche photodiode; and wherein the feedback loop computes a ratio of high- and low-states to prevent breakdown of the photodiode and possible interruption of the receiver.

46. (New) A method comprising:

receiving an optical signal in an environment exhibiting significant variation in temperature;

using a photodiode to convert the optical signal to a corresponding electrical signal;

monitoring the electrical signal outputted by the photodiode;

computing a ratio of noise energy for high and low signal in the monitored signal;

using the ratio as an indicator of imminent temperature-induced breakdown of the photodiode; and

preventing breakdown of the photodiode by adjusting gain of the photodiode when the ratio indicates that temperature-induced breakdown is imminent.